Portable Light-Weight Laser Ultrasonic System for Multi-Purpose NDT, Phase I



Completed Technology Project (2006 - 2007)

Project Introduction

This STTR Phase I project describes the development of a high-performance, robust, portable, and compact laser ultrasonic system for multi-purpose Non-Destructive Evaluation (NDE). Laser ultrasonic has now become a valuable tool for on-line inspection, demonstrating its advantages in the steel and aerospace industries. Non-destructive laser ultrasonic inspection equipments use large size laser components. They are not designed for light-weight, portable and power sensitive applications. Currently, NDE of space transportation vehicles is primarily carried out on the ground, between missions but for future space missions, more inspection will need to be performed in space in order to monitor the aging process of the structure and to insure its integrity. For inspection during space flight, the NDE equipment must be compact, lightweight, easily operated by human with limited mobility or robot, and exhibits low power consumption. To satisfy these requirements we proposed to develop a laser ultrasonic inspection system integrating an amplitude-modulated continuous wave laser source for high efficiency generation and a multi-channel random-quadrature interferometer for robust and highly sensitive detection. The proposed system takes advantage of fiber technology for both the generation and the detection in order to achieve a compact, portable and versatile inspection system.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer



Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Туре	Location
Langley Research Center(LaRC)	Lead	NASA	Hampton,
	Organization	Center	Virginia
Bossa Nova	Supporting	Industry	Venice,
Technologies, LLC	Organization		California

Primary U.S. Work Locations	
California	Virginia

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Bruno Pouet

Technology Areas

Primary:

- TX08 Sensors and Instruments
 - └─ TX08.1 Remote Sensing Instruments/Sensors
 └─ TX08.1.5 Lasers

